

The following catalog
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numbers, or doesn't
have any numbers.
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order that Acrobat
assigns it.

A3 DATA TABLE

STANDARD GROUPS

FICHE LOCATION	ILLUSTRATION
B9	. . . . . BOARD, PRINTED CIRCUIT - BEGIN SPEC H
B8	. . . . . BOARD, PRINTED CIRCUIT (BRUSH TYPE GENERATOR) - SPEC B ONLY
B7	. . . . . BOARD, PRINTED CIRCUIT (BRUSHLESS GENERATOR) - SPEC B THRU G
B1, B2	. . . . . CONTROL (AC OUTPUT)
A13, A14	. . . . . CONTROL (ENGINE INSTRUMENTS)
B10	. . . . . CONTROL, CYCLE CRANKER - OPTIONAL
A9, A10	. . . . . GENERATOR
B4	. . . . . MANIFOLD INSTALLATION (179-1500)
B6	. . . . . MANIFOLD INSTALLATION, WATER COOLED-WITH HEAT EXCHANGER (179-0282)
A5, A6	. . . . . MISCELLANEOUS ENGINE PARTS
B11	. . . . . MONITOR, ENGINE CONTROL (FIVE FAULT LIGHTS)-OPTIONAL
B13	. . . . . MONITOR, ENGINE CONTROL-PENN STATE (ONE FAULT LIGHT)
B12	. . . . . MONITOR, ENGINE CONTROL (ONE FAULT LIGHT)
A7, A8	. . . . . MOUNTING
A4	. . . . . PUMP PARTS, WATER
A11, A12	. . . . . REGULATOR, VOLTAGE-SPEC B THRU F
B3	. . . . . ROTOR, EXCITER (BRUSHLESS GENERATOR)
B5	. . . . . TANK INSTALLATION, EXPANSION (179-1011)

976-0221 (2-80)
MDEH PARTS CATALOG

INTRODUCTION

This catalog applies to the standard MDEH sets as listed below. Powered by a Ford 2712 engine (see Ford Manual). Engine parts modified or added by Onan will be in this list and have Onan part numbers. These supersede similar parts listed in the Ford manual. Onan parts are arranged in groups of related items and are identified by a reference. All parts illustrations are typical. Unless otherwise mentioned, parts are interchangeable. Right and left generator set sides are determined by facing the front end of the engine.

GENERATOR SET DATA TABLE

MODEL AND SPEC NO. †	ELECTRICAL DATA			
	WATTS	HERTZ	PHASE	WIRE
25.0MDEH-515R/£	25,000	50	1 or 3	12
30.0MDEH03R/ 30.0MDEH-15R/£	30,000 30,000	60 60	1 1 or 3	3 12

† - Specification Letter advances (A to B, B to C, etc.) with manufacturing changes.

£ - These sets are broad range reconnectable sets; refer to connection diagram inside AC control box panel.

NOTE: Hertz is a unit of frequency equal to one cycle per second.

REPLACEMENT ENGINE

100-0993 1 Engine, Replacement (Ford Motor Company Model 2712E)

General Description:

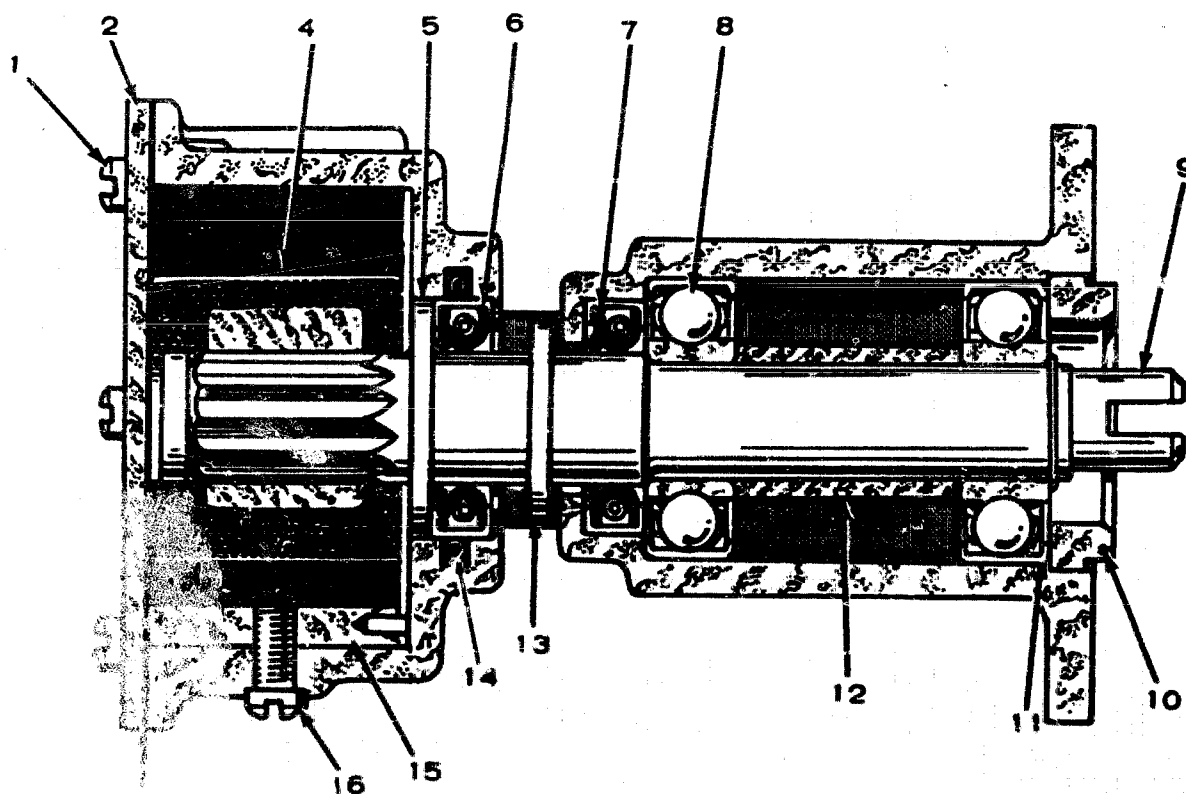
Includes — Complete Cylinder Block, Injection Pump (Simms), Oil Filter, Fuel Filter, Starting Motor (Lucas), Governor, Flywheel, Oil Pan, Water Pump, Fuel Transfer Pump, and Fan Blades (Pusher Type).

Excludes — Air Cleaner, Alternator, Voltage Regulator, Oil Pressure Sender, Water Temperature Sender, Radiator, Fan Belt, and Flywheel Housing.

NOTICE!

ITEMS REFERENCES AS OPTIONAL INDICATE PART IS FACTORY INSTALLED AND MAY NOT BE APPLICABLE TO ALL MODELS. FOR FIELD CONVERSIONS ADDITIONAL PARTS ARE USUALLY REQUIRED.

WATER PUMP PARTS (132-0146)



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
	132-0146	1	Pump Water (Complete - Less Mounting Adapter)
1	132-0165	6	Screw - Fillister Head
2	132-0164	1	Cover - End
4	132-0162	1	*Impeller Kit (Spline Seal Included)
5	132-0161	1	Spacer - Seal
6	132-0160	1	*Seal
7	132-0159	1	Seal
8	132-0158	2	Bearing - Ball
9		1	Shaft (Not Sold Separately)
10	132-0156	1	Ring - Adapter
11	132-0155	1	Ring Retaining - External
12	132-0154	1	Spacer - Bearing
13	132-0153	1	Slinger
14	132-0152	1	*"O" Ring
15	132-0151	1	Cam & Wearplate Assembly
16	132-0150	1	Screw, Fillister Head
17	132-0149	1	*Gasket
	132-0148	1	Repair Package (Includes Parts Marked *)

* - Parts Included in 132-0148 Repair Package.

This diagram illustrates the exploded view of a mechanical assembly, likely a pump or motor component. The parts are numbered 1 through 61. The assembly includes a main housing (1), a central shaft (11) with various bearings (2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61) and a drive mechanism (61). The diagram shows the relative positions and assembly sequence of the components, including a motor (11), a pump head (12), a drive shaft (13), and various mounting brackets (14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61).

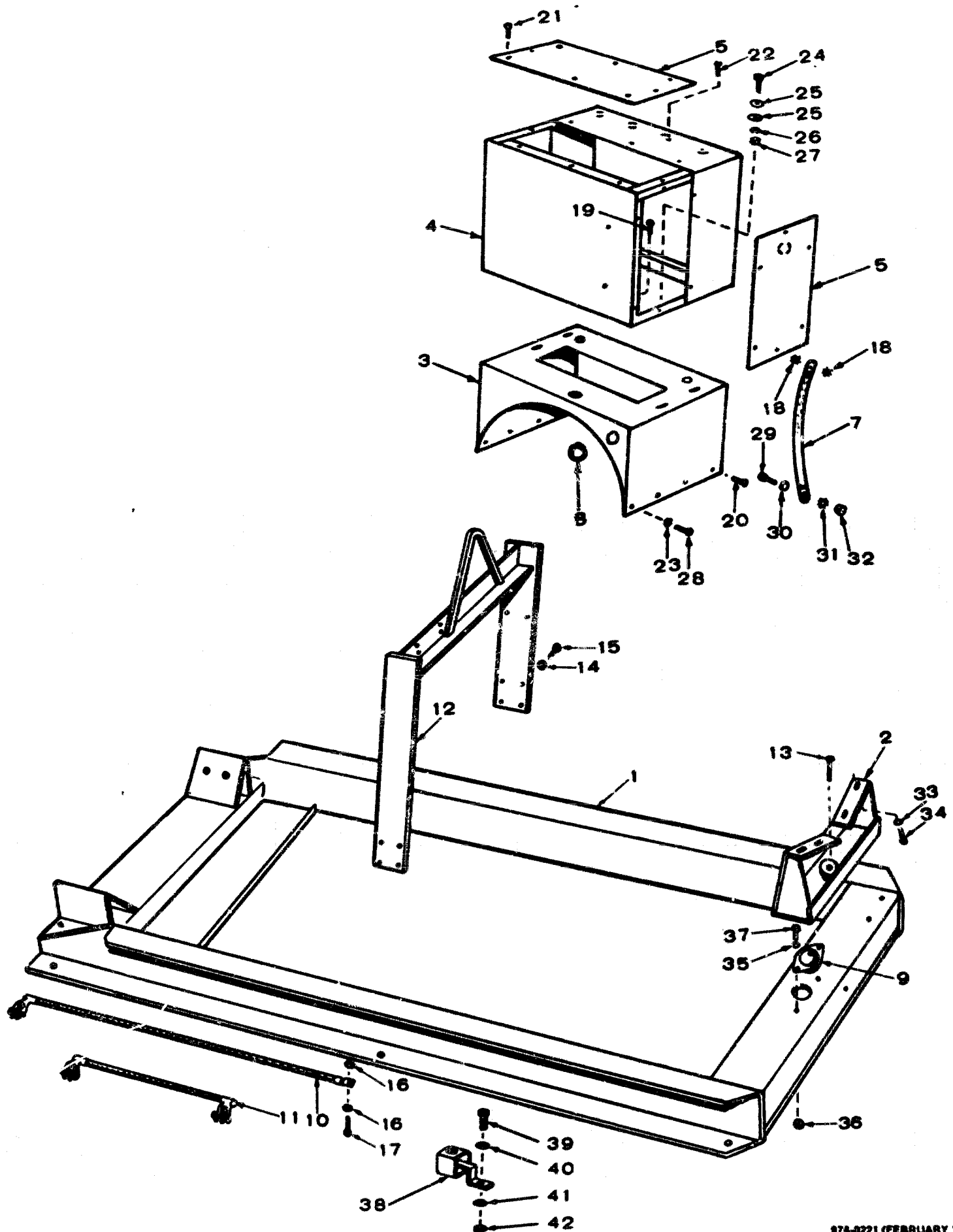
MISCELLANEOUS ENGINE PARTS

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	140-1091	1	Cleaner, Air
2	503-0597	1	Hose, Air Cleaner
3	503-0354	2	Clamp, Air Cleaner Hose
4	306-0214	1	Bracket, Solenoid Mounting
5	307-0628	1	Solenoid, Stop (12 Volt)
6	306-0222	1	Plunger, Stop Solenoid
7	518-0203	1	Ring, Retaining
8	518-0218	2	Ring, Retaining
9	306-0161	1	Spring, Plunger
10	306-0162	1	Spacer, Solenoid Mounting
11	306-0226	1	Brace, Solenoid Bracket
12	306-0193	1	Cover, Solenoid Plunger
13	516-0103	1	Pin, Roll (1/8 x 1/2") x Spring Retaining
14	306-0215	1	Rod, Stop Solenoid to Joint
15	150-0638	1	Joint, Rod to Injection Pump
16	312-0058	1	Condenser
17	511-0084	1	Belt, Charge Alternator Drive
18	502-0051	1	Coupling, Pipe (1/8")
19	191-0802	1	Cover, Starter Motor Hole
20	502-0361	1	Tee, Fuel Return (1/8")
21	191-1257	1	*Alternator, Charge (Motorola #70D44477E01)
22	191-0101	1	Bracket, Alternator Adjusting
23	191-0786	1	Bracket, Alternator Mounting
24	191-0781	1	Pulley, Charge Alternator
25	191-0681	1	Cable, Alternator to Regulator
26	502-0192	1	Connector, Fuel Pump Inlet (1/8")
27	191-0725	1	Guard, Alternator Belt
28	332-1292	1	Bracket, Terminal
29	191-0683	1	Regulator, Alternator
30	140-1089	1	Element, Air Cleaner
31	102-0619	1	Adapter, Oil Drain
32	102-0532	1	Gasket, Oil Drain
33	505-0224	1	Nipple, Pipe - Oil Drain
34	505-0135	1	Nipple, Half - Oil Drain
35	504-0030	1	Valve, Oil Drain
36	503-0484	1	Hose, Oil Drain
37	503-0131	1	Clamp, Hose - Oil Drain
38	ELEMENT, ENGINE COOLANT TEMPERATURE		
	193-0246	1	Begin Spec H
	193-0104	1	Spec B through G
39	309-0179	1	Switch, Engine Coolant Hi-Temperature

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
40	ELEMENT, OIL PRESSURE		
	193-0244	1	Begin Spec H
	193-0108	1	Specs B through G
41	309-0169	1	Switch, Low Oil Pressure
42	800-0095	1	Screw (1/2-13 x 2-1/4") - Alternator Mounting
43	862-0016	1	Nut, Hex (1/2-13) - Alternator Mounting
44	850-0060	1	Washer, Lock (1/2) - Alternator Mounting
45	115-0025	2	Nut, Hex (1/4)
46	856-0010	1	Washer, Lock EIT (3/8")
47	800-0047	1	Screw, Cap - Hex Head (3/8-16 x 5/8")
48	800-0025	1	Screw, Cap - Hex Head (5/16-18 x 5/8")
49	850-0055	2	Washer, Lock - Spring (7/16")
50	800-0069	2	Screw, Cap - Hex Head (7/16-14 x 3/4")
51	812-0151	2	Screw, Machine - Round Head (1/4-20 x 3/4")
52	850-0040	2	Washer, Lock - Spring (1/4")
53	962-0001	2	Nut, Hex (1/4-20)
54	850-0050	2	Washer, Lock - Spring (3/8")
55	800-0048	2	Screw, Cap - Hex Head (3/8-16 x 7/8")
56	800-0025	1	Screw, Cap - Hex Head (5/16-18 x 5/8")
57	526-0100	1	Washer, Flat (9/16" ID x 1-3/8" OD x 7/64" Thk)
58	850-0045	1	Washer, Lock - Spring (5/16")
59	110-1282	1	Bolt, Lo Engine Temperature Switch
60	309-0269	1	Switch, Lo Engine Temperature (Install under cylinder head bolt in center of engine)
61	LINE, FUEL		
	501-0225	1	45" Long
	501-0227	1	24" Long
	130-1015	1	Outlet, Water (Not Illustrated)
	130-1016	1	Gasket, Water Outlet (Not Illustrated)

* - For components, contact your nearest Motorola dealer or Motorola Automotive Products, Inc. 9401 W. Grand Ave., Franklin Park, Illinois 60131

MOUNTING

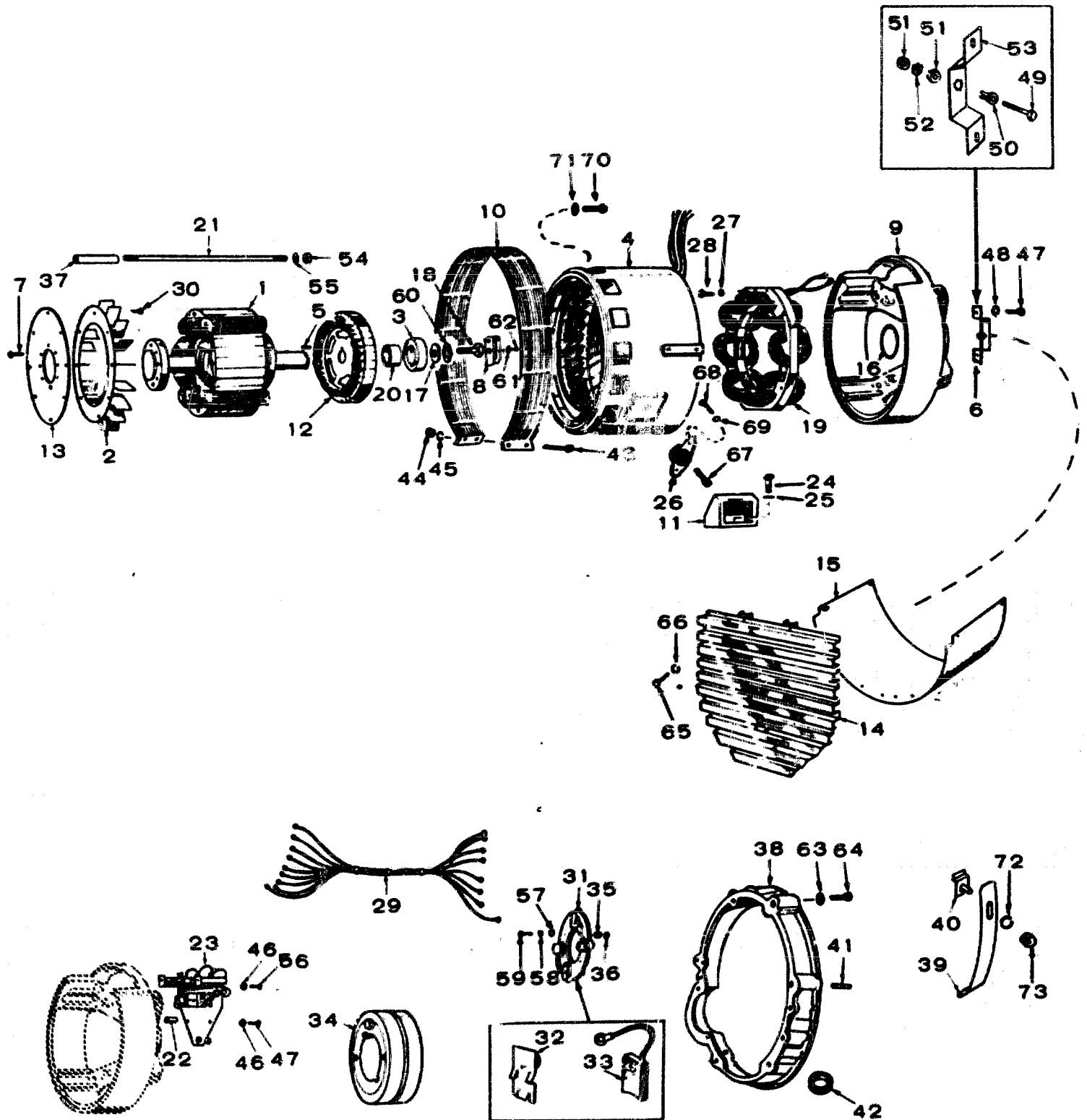


978-0221 (FEBRUARY 1980)

MOUNTING

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	403-0917	1	Base, Skid	21	815-0028	18	Screw, Machine - Truss Head (#10-32 x 3/8")
2	403-0910	1	Support, Engine Mount	22	821-0014	4	Screw, Cap - Hex Head - Self Locking (5/16-18 x 1/2")
3	301-3154	1	Saddle, Control Box Housing	23	853-0016	4	Washer, Lock - ET (5/16")
4	301-3155	1	Housing, Control Box	24	800-0003	4	Screw, Cap - Hex Head (1/4-20 x 1/2")
5	301-3156	3	Panel, Control Box Housing (Side)	25	526-0018	8	Washer, Flat (17/64" I.D. x 5/8" O.D. x 1/16" Thk)
7	337-0090	1	Strap, Ground	26	850-0040	4	Washer, Lock - Spring (1/4")
8	508-0203	1	Grommet, Nylon - Control Box Housing	27	862-0001	4	Nut, Machine - Hex (1/4-20)
9	402-0030	1	Cushion, Vibration - Engine End	28	800-0537	4	Screw, Cap - Hex Head (5/16-18 x 1/2")
10	CABLE, BATTERY			29	800-0091	1	Screw, Cap - Hex Head (1/2-13 x 1-1/4")
	416-0530	1	16" Long (Negative)	30	850-0060	1	Washer, Lock - Spring (1/2")
	416-0531	1	24" Long (Positive)	31	856-0013	1	Washer, Lock - EIT (1/2")
11	416-0446	1	Cable, Battery (9")	32	862-0016	1	Nut, Hex (1/2-13)
12	403-0036	1	Bracket, Lifting	33	850-0050	2	Washer, Lock - Spring (3/8")
13	800-0520	3	Screw (3/4-10 x 1") - Cushion Mounting	34	800-0050	2	Screw, Cap - Hex Head (3/8-16 x 1")
14	850-0055	8	Washer, Lock - Spring (7/16")	35	850-0060	2	Washer, Lock - Spring (1/2")
15	800-0072	8	Screw, Cap - Hex Head (7/16-14 x 1-1/4")	36	862-0016	2	Nut, Hex (1/2-13)
16	856-0012	2	Washer, Lock EIT (7/16")	37	800-0090	2	Screw, Cap - Hex Head (1/2-13 x 1")
17	800-0069	1	Screw, Cap - Hex Head (7/16-14 x 3/4")	38	332-1473	1	Lug, Solderless
18	856-0012	2	Washer, Lock EIT (7/16")	39	800-0028	1	Screw, Cap - Hex Head (5/16-18 x 1")
19	821-0010	3	Screw, Cap - Hex Head - Self Locking (1/4-20 x 1/2")	40	850-0045	1	Washer, Lock - Spring (5/16")
20	821-0010	4	Screw, Cap - Hex Head - Self Locking (1/4-20 x 1/2")	41	856-0008	1	Washer, Lock - EIT (5/16")
				42	862-0015	1	Nut, Hex (5/16-18)

GENERATOR

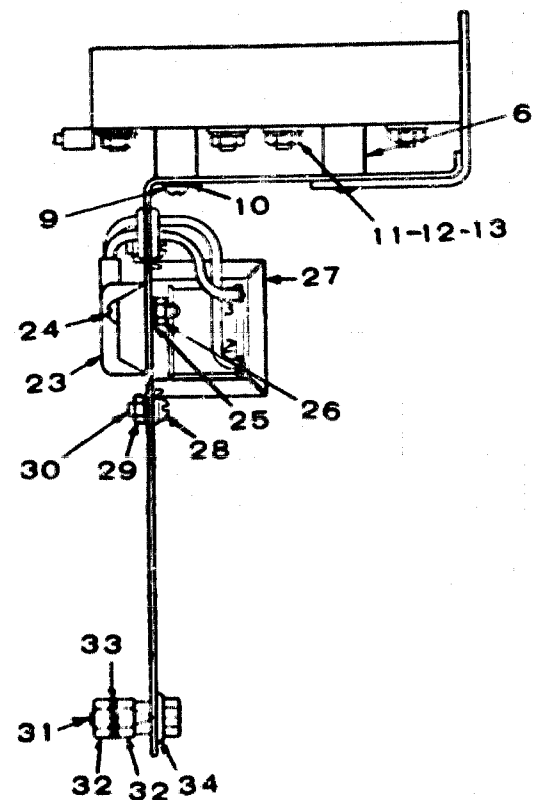
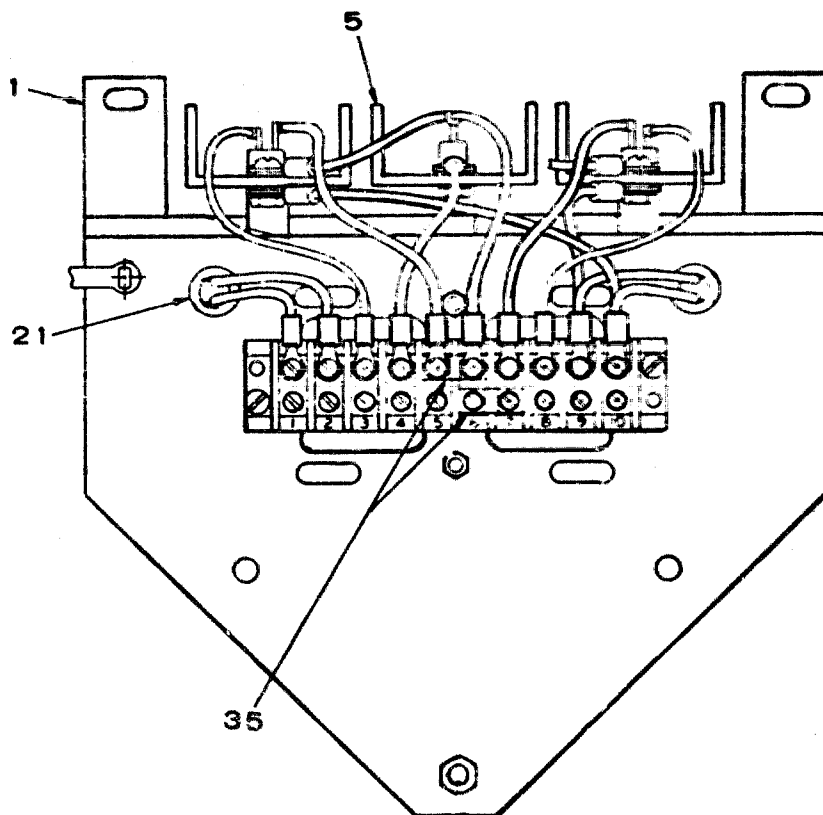
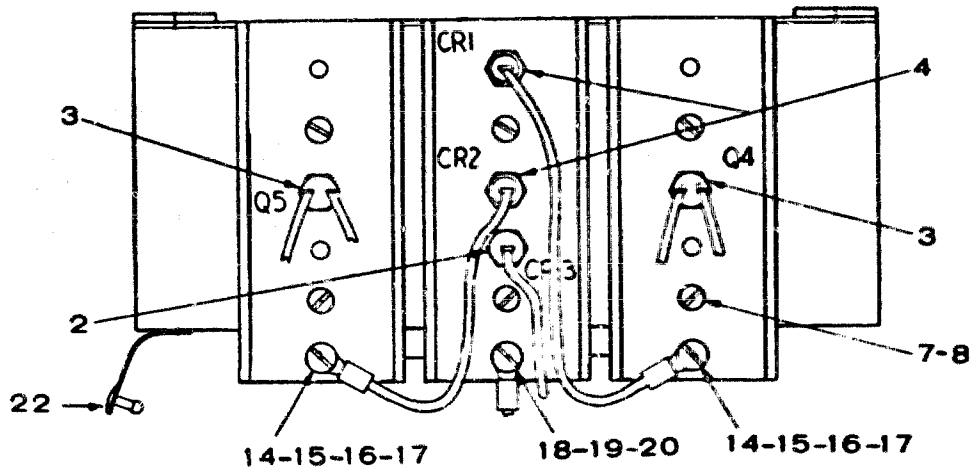


REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	ROTOR ASSEMBLY, WOUND		
			50 Hertz and 60 Hertz Broad Range Sets
	201-1640	1	Spec B (Includes Parts Marked *)
	201-1716	1	Spec C through H (Includes Parts Marked &)
	201-2666	1	Begin Spec J (Includes Parts Marked &)

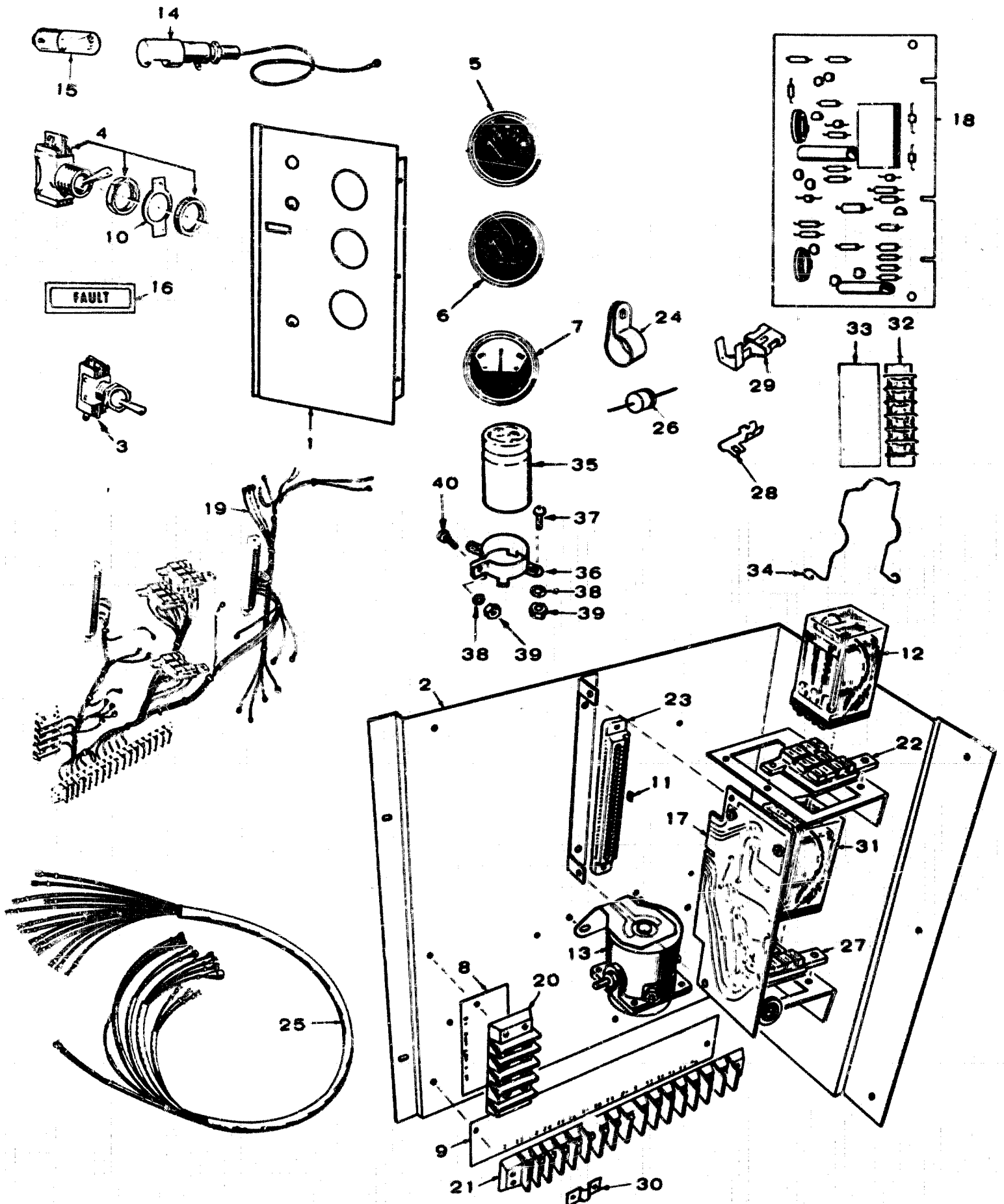
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
			60 Hertz, 120/240, Single Phase Sets
	201-1643	1	Spec B (Includes Parts Marked *)
	201-1719	1	Spec C Through H (Includes Parts Marked &)
	201-2669	1	Begin Spec J (Includes Parts Marked &)

976-0221 (FEBRUARY 1960)

VOLTAGE REGULATOR - SPEC B THROUGH F



CONTROL ENGINE INSTRUMENTS



976-0221 (FEBRUARY 1960)

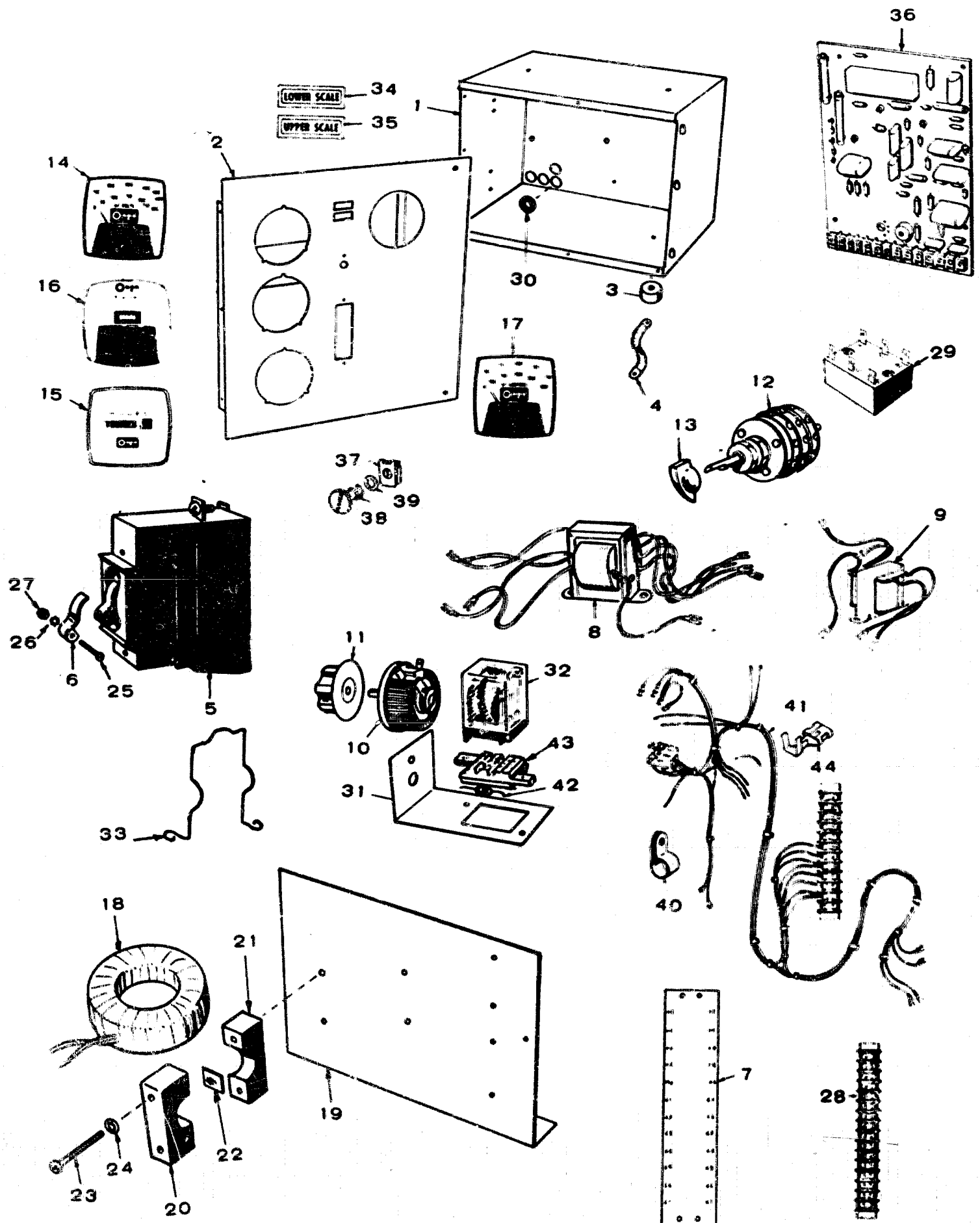
CONTROL ENGINE INSTRUMENTS

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
	PANEL ONLY, ENGINE CONTROL		
	301-3165	1	Sets With One Fault Light
	301-3267	1	Sets With Five Fault Lights (Optional)
2	301-3253	1	Bracket, Engine Control
3	SWITCH, SELECTOR		
	308-0138	1	Standard
	308-0327	1	Penn State
4	308-0002	1	Switch, Panel Light - Specs B through G and Begin Spec J
5	GAUGE, OIL PRESSURE		
	193-0107	1	Specs A through G
	193-0243	1	Begin Spec H
6	GAUGE, ENGINE COOLANT TEMPERATURE		
	193-0106	1	Specs A through G
	193-0245	1	Begin Spec H
7	302-0061	1	Ammeter, Charge (30-0-30)
8	332-1239	1	Strip, Marker (B* Remote, and Ground Alarm)
9	STRIP, MARKER		
	332-1241	1	Specs B through G (21 through 36) Begin Spec H
	332-1241	1	Sets With One Fault Light (21 through 36)
	332-1559	1	Sets With Five Fault Lights (21 through 40)
10	308-0003	1	Plate, Switch (On/Off) - Specs A through G
11	332-1276	2	Plug, Keying (Optional Sets with Five Fault Lights use Qty. of 1)
12	307-1058	2	Relay (1 Start Disconnect, 1 Ignition)
13	307-1031	1	Relay, Start Solenoid
14	322-0149	1	Holder, Lamp - Specs B through G and Begin Spec J
15	322-0004	1	Lamp, Panel - Specs B through G and Begin Spec J
16	LAMP, FAULT		
	322-0128	1	Standard Sets
	332-0107	1	Overcrank (Optional)
	322-0111	1	Overspeed (Optional)
	322-0108	1	Low Oil Pressure (Optional)
	322-0109	1	High Engine Coolant Temperature (Optional)
	322-0110	1	Low Engine Coolant Temperature (Optional)
17	CONTROL, CRANKER		
	300-0733	1	Standard Cranker
	300-0714	1	Cycle Cranker (Optional)
18	MONITOR, ENGINE CONTROL (See Separate Group for Components)		
	300-0679	1	Sets With One Fault Light
	300-0681	1	Sets With Five Fault Lights - Optional
	300-0730	1	Penn State Sets with One Fault Light

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
19	HARNESS ASSEMBLY, WIRING - CONTROL (Includes Parts Marked *)		
			Specs B through G
	338-0528	1	Sets With One Fault Light
	338-0534	1	Sets With Five Fault Lights - Optional
			Begin Spec H
	338-1065	1	Sets With One Fault Light
	338-1066	1	Sets With Five Fault Lights - Optional
20	332-0537	1	*Block, Terminal - 4 Place
21	*BLOCK, TERMINAL		
	332-0795	1	Spec B through G (16 Place) Begin Spec H
	332-0795	1	Sets With One Fault Light (16 Place)
	332-1005	1	Sets With Five Fault Lights (20 Place)
22	323-0765	2	*Socket, Relay - 11 Place (Includes Terminal)
23	332-1271	2	*Housing, Printed Circuit Board Terminal
24	332-0051	1	Clip, Tinnerman
25	338-0537	1	Harness Assembly, Wiring - Engine to Control
26	357-0004	1	Rectifier, Diode (Part of Standard Cranker Control)
27	323-0764	1	*Socket, Relay - 8 Place (Includes Terminals)
28	332-1269	As Req.	*Terminal, PC Board
29	332-1280	As Req.	*Terminal, Crimp
30	332-1043	1	*Jumper, Terminal - Sets With One Fault Light
31	307-1061	1	Relay, Starter Protection - Begin Spec C
32	332-0899	1	*Block, Terminal (6 Place) - Sets With Five Fault Lights - Optional
33	332-1240	1	*Strip, Marker (53 through 58) - Sets With Five Fault Lights - Optional
34	307-1157	3	Spring, Relay Hold-down
35	356-0072	1	Capacitor (Begin Serial #A780293758 During Spec H)
36	356-0070	1	Bracket, Mounting (Begin Serial #A780293758 During Spec H)
37	812-0063	2	Screw, Machine - Roundhead (#6-32 x 1/2") Begin Serial #A780293758 During Spec H
38	853-0003	3	Washer, Lock - ET (#6) Begin Serial #A780293748 During Spec H
39	860-0006	3	Nut, Hex (#6-32) Begin Serial #A780293758 During Spec H
40	812-0061	1	Screw, Machine - Roundhead (#6-32 x 3/8") Begin Serial #A780293758 During Spec H

* - Parts Included in Wiring Harness Assembly.

CONTROL AC OUTPUT



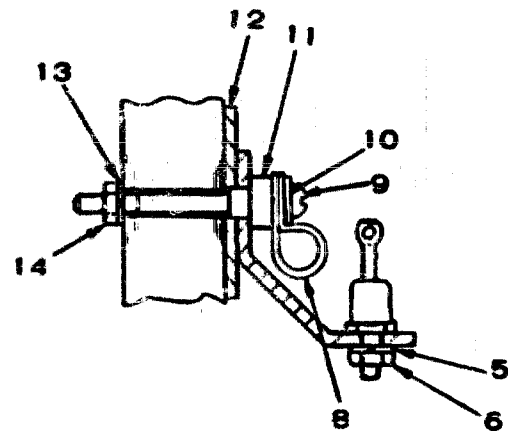
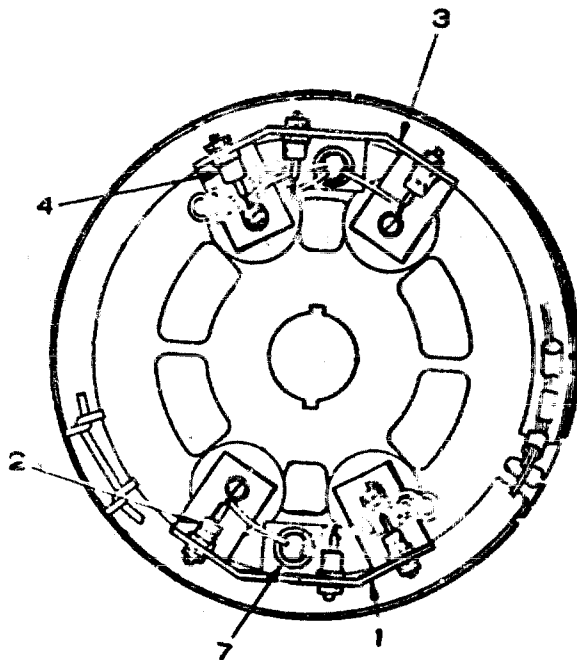
CONTROL AC OUTPUT

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	301-3158	1	Box Only, Control
2	PANEL ONLY, CONTROL		Sets Without Meter Panel
	301-3822	1	Single Phase Sets
	301-3274	1	Three Phase Sets
			Sets With Meter Panel
	301-3169	1	Single Phase Sets
	301-3170	1	Three Phase Sets
3	402-0078	4	Mount, Rubber - Control Box
4	337-0049	1	Strap, Ground
5	BREAKER, CIRCUIT		
	320-0002	1	Brush Type Generator
	320-0431	1	Brushless Generator
6	320-0307	1	Lock, Circuit Breaker Handle
7	STRIP, MARKER		
	332-1248	1	Sets Without Meter Panel
	332-1242	1	Sets With Meter Panel
8	TRANSFORMER, VOLTAGE		
	315-0431	1	Begin Spec H
	315-0342	1	Specs B through G
9	REACTOR, COMMUTATOR (Begin Spec G)		
	315-0384	1	With Leads and Terminals
	315-0343	1	Reactor Only, Less Leads and Terminals
10	303-0170	1	Rheostat
11	303-0032	1	Knob, Thermostat
12	SWITCH, SELECTOR		
	308-0012	1	Sets Without Meter Panel
	308-0284	1	Sets With Meter Panel
13	303-0076	1	Knob, Selector Switch
14	VOLTMETER		
	302-0421	1	Single Phase Sets
	302-0718	1	Three Phase Sets
15	METER, RUNNING TIME		
	302-0469	1	50 Hertz Sets
	302-0466	1	60 Hertz Sets
16	METER, FREQUENCY (Generator Sets With Meter Panel)		
	302-0256	1	50 Hertz Sets
	302-0221	1	60 Hertz Sets
17	AMMETER (Generator Sets With Meter Panel)		
	302-0412	2	Single Phase Sets
	302-0719	1	Three Phase Sets
18	TRANSFORMER, CURRENT		
	302-0209	2	Single Phase Sets
	302-0079	3	Three Phase Sets
19	302-0729	1	Bracket, Transformer Mounting
20	CLAMP, TRANSFORMER MOUNTING (Upper)		
	302-0235	2	Single Phase Sets
	302-0235	3	Three Phase Sets
21	CLAMP, TRANSFORMER MOUNTING (Lower)		
	302-0230	2	Single Phase Sets
	302-0236	3	Three Phase Sets
22	302-0253	As Req.	Shim, Transformer Mounting
23	SCREW, MACHINE - ROUNDHEAD (#10-32 x 2")		
	813-0110	4	Single Phase Sets
	813-0110	6	Three Phase Sets

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
24	WASHER, LOCK - IT (#10)		
	854-0010	4	Single Phase Sets
	854-0010	6	Three Phase Sets
25	815-0203	1	Screw, Machine Round Head (#10-32 x 7/8") - Penn State
26	854-0010	2	Washer, Lock - IT (#10) Penn State
27	871-0010	1	Nut, Machine - Hex (#10-32) - Penn State
	*BLOCK, TERMINAL		
	332-0607	1	Sets With Meter Panel (12 Place)
	332-0795	1	Sets With Meter Panel (16 Place)
29	305-0524	1	Bridge, Rectifier - Begin Spec G
30	508-0001	4	Grommet, Rubber
31	301-3244	1	Bracket, Relay Mounting - Three Phase Sets
32	307-1061	1	Relay, Voltage Selector - Three Phase Sets
33	307-1157	1	Spring Relay Holddown - Three Phase Sets
34	322-0130	1	Light, Lower Scale
35	322-0131	1	Light, Upper Scale
36	BOARD ASSEMBLY, PRINTED CIRCUIT (See Separate Group for Components)		
	332-1956	1	Begin Spec H
	322-1268	1	Spec B through G
37	406-0332	2	Fastener
38	406-0333	2	Stud, Fastener
39	406-0334	2	Washer, Stud Fastener
40	332-0051	1	Clip, Tinnerman
41	HARNES, WIRING - AC CONTROL (Includes Parts Marked *)		
			Generator Sets Without Meter Panel
	338-0522	1	Single Phase Sets - Spec B through F
	338-0765	1	Single Phase Sets - Begin Spec B
	338-0524	1	Three Phase Sets - Spec B through F
	338-0764	1	Three Phase Sets - Begin Spec G
			Generator Sets With Meter Panel
	338-0523	1	Single Phase Sets - Spec B through F
	338-0735	1	Single Phase Sets - Begin Spec G
	338-0525	1	Three Phase Sets - Spec B through F
	338-0730	1	Three Phase Sets - Begin Spec G
42	350-0556	1	*Resistor (47,000-Ohm, 1/2 Watt)
43	323-0764	1	*Socket, Relay - Three Phase Sets
44	332-1280	As Req.	*Terminal, Crimp - Three Phase Sets

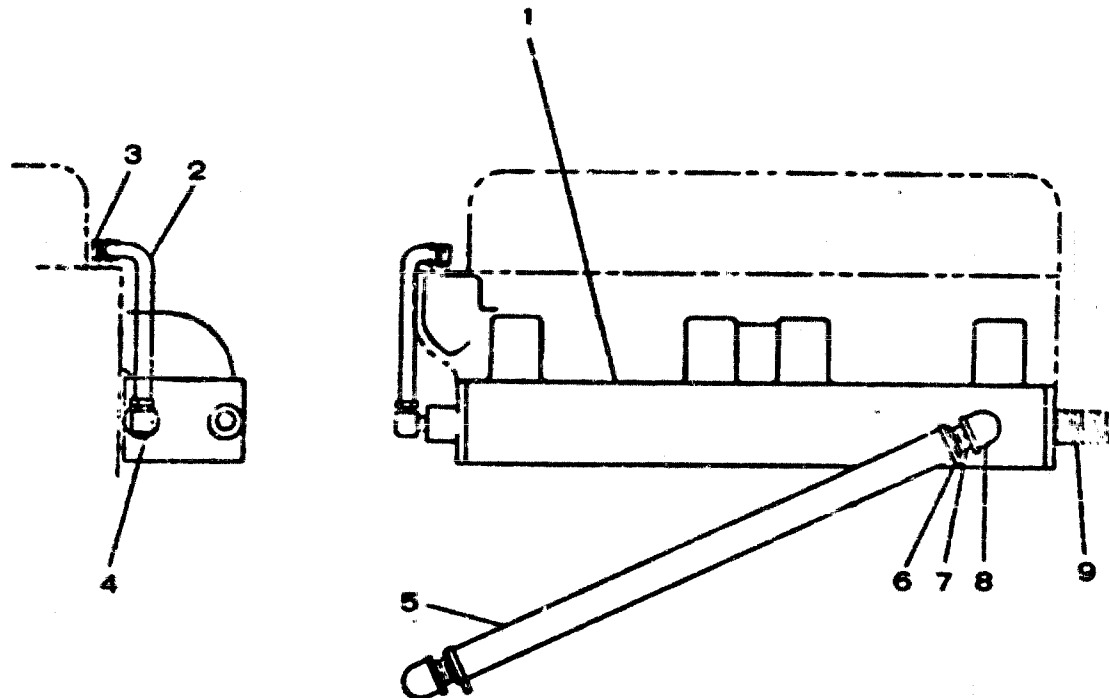
* - Parts Included in Wiring Harness Assembly.

EXCITER ROTOR (BRUSHLESS GENERATOR)



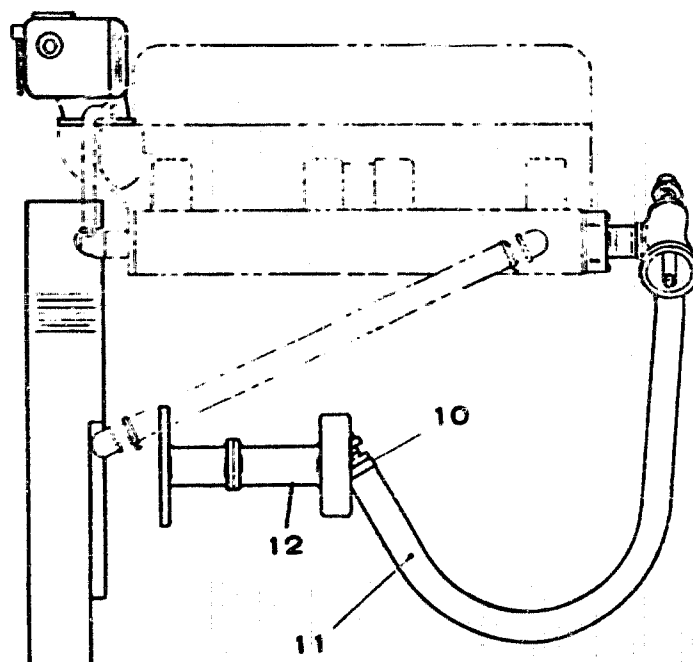
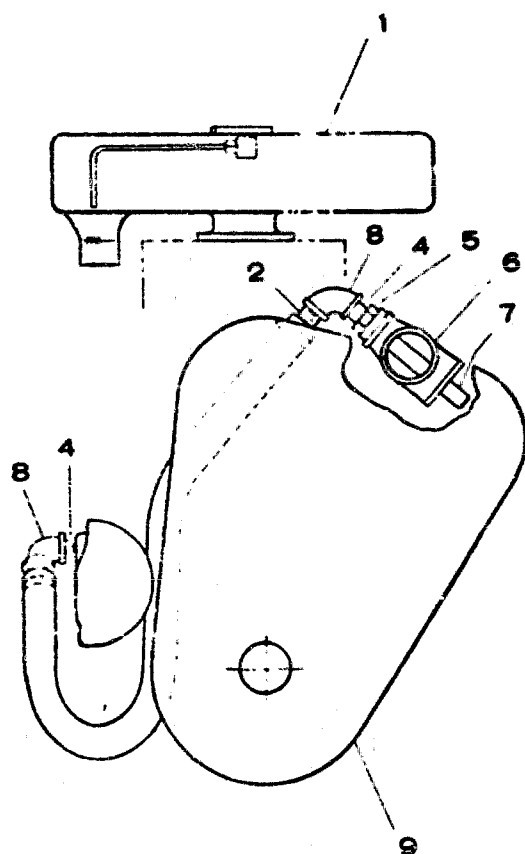
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
	201-1739	1	Rotor Assembly, Wound - Exciter (Complete)
1	363-0055	1	Heat Sink, Rectifier - Negative
2	358-0015	3	Rectifier, Diode - Negative (CR4, CR5 & CR6)
3	363-0054	1	Heat Sink, Rectifier - Positive
4	358-0016	3	Rectifier, Diode - Positive (CR1, CR2 & CR3)
5	850-0030	6	Washer, Lock Spring (#10) Diode Mounting
6	870-0053	6	Nut, Hex - Diode Mounting (10-32)
7	508-0093	2	Grommet, Rubber
8	332-0050	2	Clip, Wire
9	813-0110	4	Screw, Roundhead - Heat Sink Mounting (10-32 x 2")
10	526-0009	4	Washer, Flat - Heat Sink Mounting (#10)
11	508-0187	4	Bushing, Insulating - Heat Sink Mounting
12	508-0156	4	Washer, Insulating - Heat Sink Mounting
13	850-0030	4	Washer, Lock Spring - Heat Sink Mounting (#10)
14	870-0053	4	Nut, Hex - Heat Sink Mounting (#10-32)

MANIFOLD INSTALLATION (179-1500)



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	154-0888	1	Manifold
2	130-0674	1	Line Assembly, Water
3	502-0074	1	Elbow
4	502-0073	1	Elbow
5		1	Hose, (Order 30" of Bulk Hose #503-0355)
6	503-0183	2	Clamp
7	503-0135	2	Nipple Half (3/8 x 1-1/2")
8	505-0120	2	Elbow, Street (3/8" x 90°)
9	505-0173	1	Nipple (2")

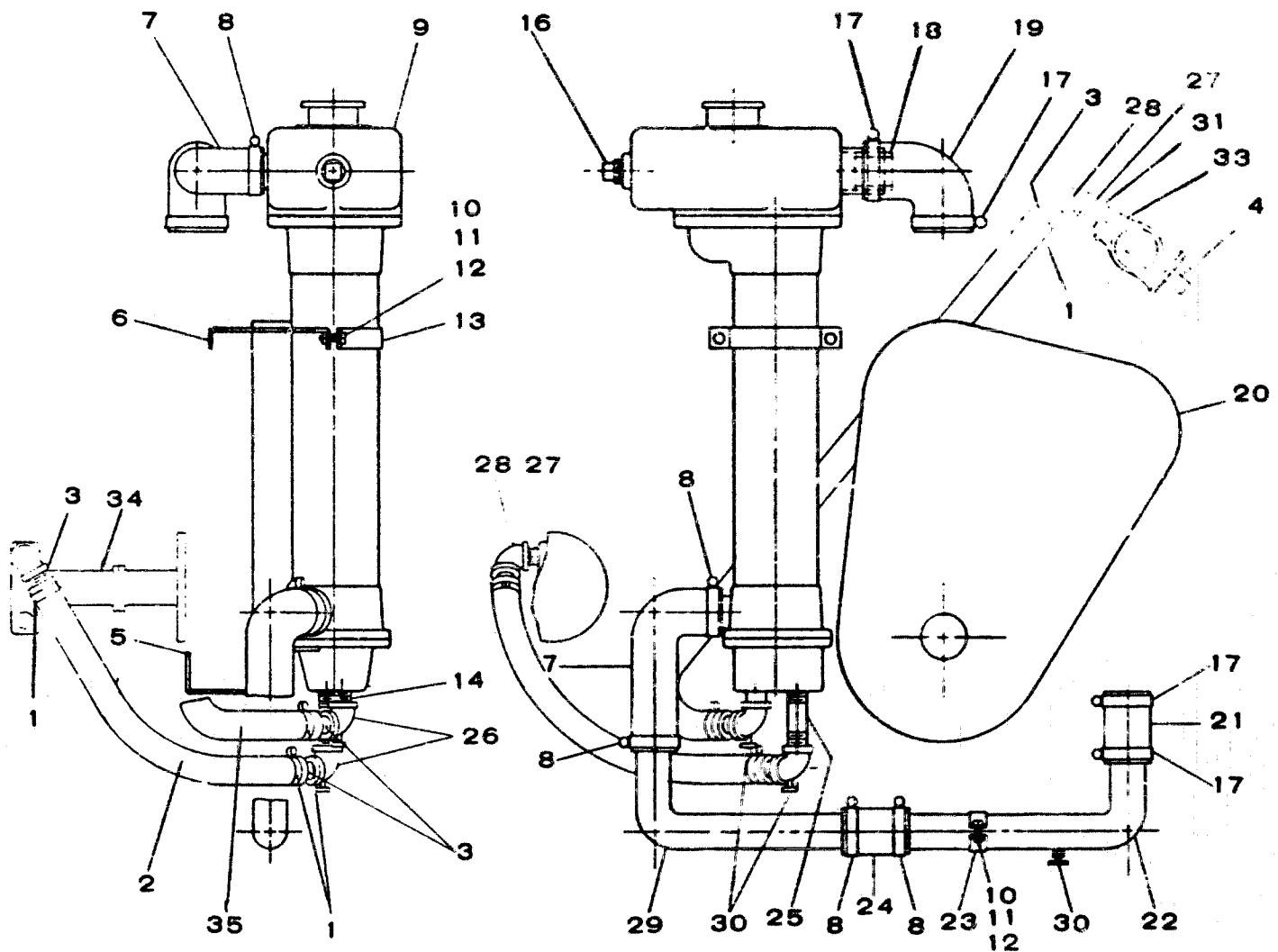
EXPANSION TANK INSTALLATION (179-1011)



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	130-0705	1	Tank, Expansion
2	505-0324	2	Nipple, Half (3/4)
4	505-0102	2	Nipple, Close (3/4)
5	505-0772	1	Bushing, Tank (3/4)
6	505-0771	1	Tee, Reducing
7	130-0725	1	Tube, Water Outlet
8	505-0132	2	Elbow, Pipe (3/4)
9	130-0785	1	Guard, Belt
10	503-0189	2	Clamp, Hose
11	503-0249	4 ft	Hose
12	132-0109	1	Pump, Water (Includes Gear Drive Assembly) (See Separate Entry for Pump Only)
	132-0146	1	*Pump Only, Water (Part of 132-0109) (See Separate Group for Components)
	132-0167	1	Gasket, Water Pump Only Mounting

* - Includes Pump Mounting Gasket.

WATER COOLED MANIFOLD INSTALLATION - WITH HEAT EXCHANGER (179-0282)



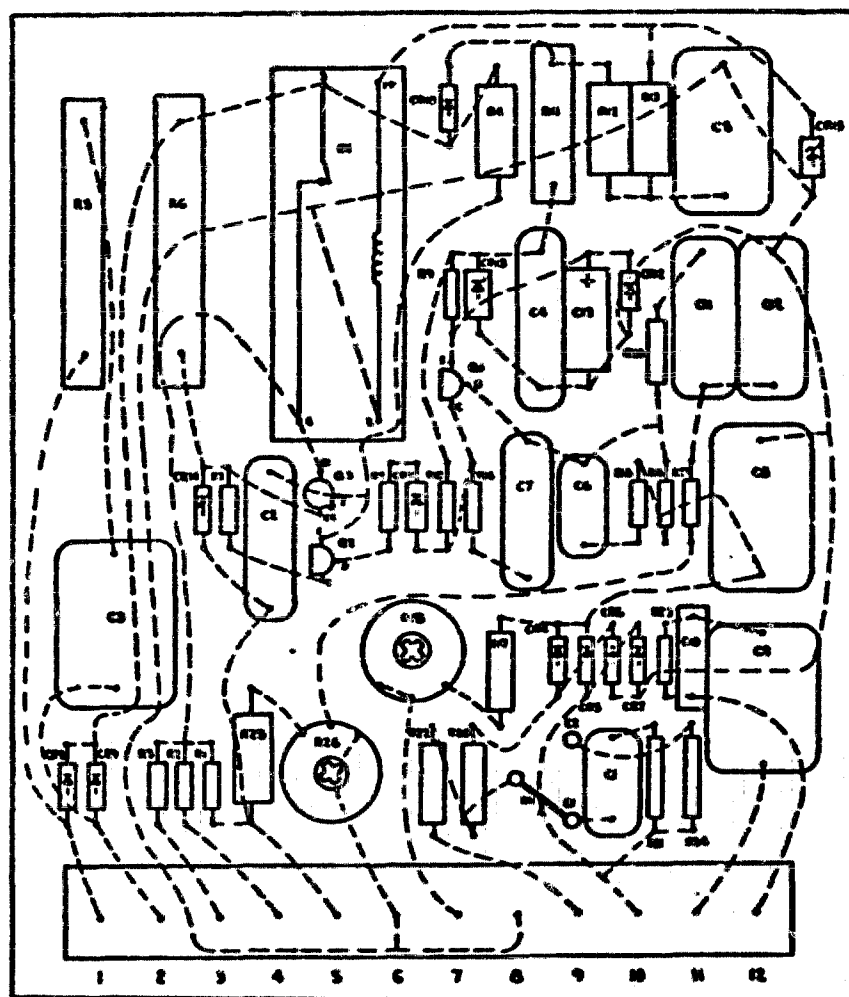
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	503-0189	4	Clamp, Hose
2	503-0845	1	Hose
3	505-0907	4	Nipple, Half - Brass
4	130-0725	1	Tube, Exhaust - Water Outlet
5	130-0715	1	Bracket, Heat Exchanger Mounting
6	130-0721	1	Bracket, Heat Exchanger Mounting
7	503-0553	2	Hose
8	503-0004	5	Clamp, Hose
9	130-0505	1	Heat Exchanger
10	800-0007	3	Screw, Cap - Hex head (1/4-20 x 1")
11	850-0040	3	Washer, Lock - Spring (1/4")
12	862-0001	3	Nut, Hex (1/4-20)
13	130-0722	1	Clamp, Heat Exchanger Mounting
14	505-0908	1	Nipple, Close - Brass (1")
16	505-0130	1	Pipe Plug (3/4)
17	503-0365	4	Clamp, Hose
18	130-0508	1	Tube
19	503-0554	1	Hose
20	130-0785	1	Guard, Belt
21	503-0552	1	Hose

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
22	130-0724	1	Tube, Water Inlet
23	331-0101	1	Hanger
24	503-0003	1	Hose
25	505-0910	1	Nipple, Brass (1" x 3")
26	505-0938	2	Elbow, Reducer - Brass (1 x 3/4")
27	505-0812	2	Nipple, Close - Brass (3/4")
28	505-0909	2	Elbow, Union - Brass
29	130-0349	1	Tube
30	504-0005	3	Drain Cock
31	505-0772	1	Bushing Tank
32	526-0127	2	Washer, Flat (13/32" ID x 25/32" OD x 1/8" Thk)
33	505-0771	1	Tee, Reducing
34	132-0109	1	Pump, Water (Includes Gear Drive Assembly) (See Separate Entry for Pump Only)
35	503-0853	1	Hose
	132-0146	1	*Pump Only, Water (Part of 132-0109) (See Separate Group for Components)
	132-0167	1	Gasket, Water Pump Only Mounting

* - Includes Pump Mounting Gasket.

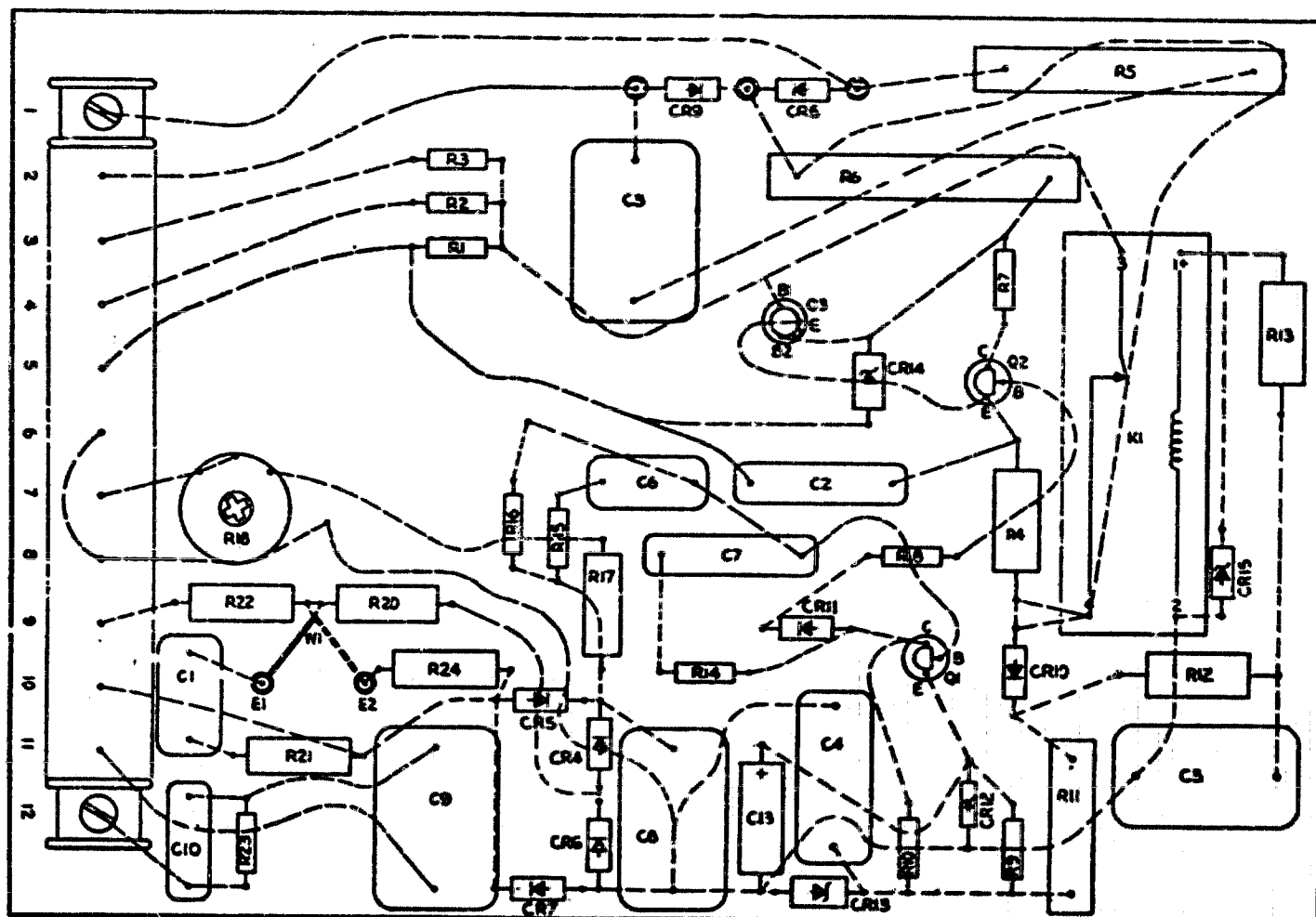
978-0221 (FEBRUARY 1980)

PRINTED CIRCUIT BOARD ASSEMBLY - BRUSHLESS TYPE GENERATOR (SPECS B THROUGH G)



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
	332-1268	1	Printed Circuit Board - Complete	R7	350-0398	1	Resistor (3,000-Ohm, 1/2 Watt)
TB1	332-1252	1	Terminal Block	R18, R16	350-0447	2	Resistor (330,000-Ohm, 1/2 Watt)
C1	355-0018	1	Capacitor (.47., 100 Volt)	R9, R10	350-0423	2	Resistor (33,000-Ohm, 1/2 Watt)
C2, C7	355-0005	2	Capacitor (.22 Mfd., 200 Volt)	R11, R12	352-0151	2	Resistor, Fixed (15,000-Ohm 5 Watt)
C3, C9	355-0017	2	Capacitor (.47 Mfd., 400 Volt)	R13	350-1007	1	Resistor (6,800-Ohm, 2 Watt)
C4, C12	355-0006	2	Capacitor (.47 Mfd., 200 Volt)	R14	350-0443	1	Resistor (220,000-Ohm, 2 Watt)
C5, C8	355-0016	2	Capacitor (1 Mfd., 100 Volt)	R15, R27	350-0435	2	Resistor (100,000-Ohm, 1/2 Watt)
C6	355-0015	1	Capacitor (.1 Mfd., 200 Volt)	R17	351-0521	1	Resistor, Metal Film 13,000-Ohm, 1/4 Watt)
C10	355-0014	1	Capacitor (.047 Mfd., 200 Volt)	R18	303-0168	1	Potentiometer
C11	355-0020	1	Capacitor (.1 Mfd., 400 Volt)	R20, R22	351-0520	2	Resistor, Metal Film (28,000-Ohm, 1/4 Watt)
C13	356-0039	1	Capacitor (100 Mfd., 10 Volt)	R21	351-0522	1	Resistor, Metal Film (5,110-Ohm, 1/4 Watt)
CR4,5,6,7, 8,9,10,11	357-0014	8	Rectifier, Silicon	R24	351-0523	1	Resistor, Metal Film (8,870-Ohm, 1/4 Watt)
CR12	359-0016	1	Diode, Zener (6.8 Volt)	R25	350-1011	1	Resistor (10,000-Ohm, 2 Watt)
CR13	359-0025	1	Diode, Zener (20 Volt)	R26	303-0164	1	Potentiometer
CR14	359-0026	1	Diode, Zener (18 Volt)	R28	350-0459	1	Resistor (1.0 Megohm, 1/2 Watt)
CR15	359-0015	1	Diode, Zener (24 Volt)				
K1	307-1063	1	Relay, Magnetic Reed				
Q1, Q2	362-0017	2	Transistor, Silicon				
Q3	361-0004	1	Transistor, Unijunction				
R1, R23	350-0355	2	Resistor (47-Ohm, 1/2 Watt)				
R2, R3	350-0351	2	Resistor (33-Ohm, 1/2 Watt)				
R4	350-1075	1	Resistor (4.7 Megohm, 2 Watt)				
R5	353-0040	1	Resistor, Fixed (270-Ohm, 10 Watt)				
R6	353-0039	1	Resistor, Fixed (5,000-Ohm, 15 Watt)				

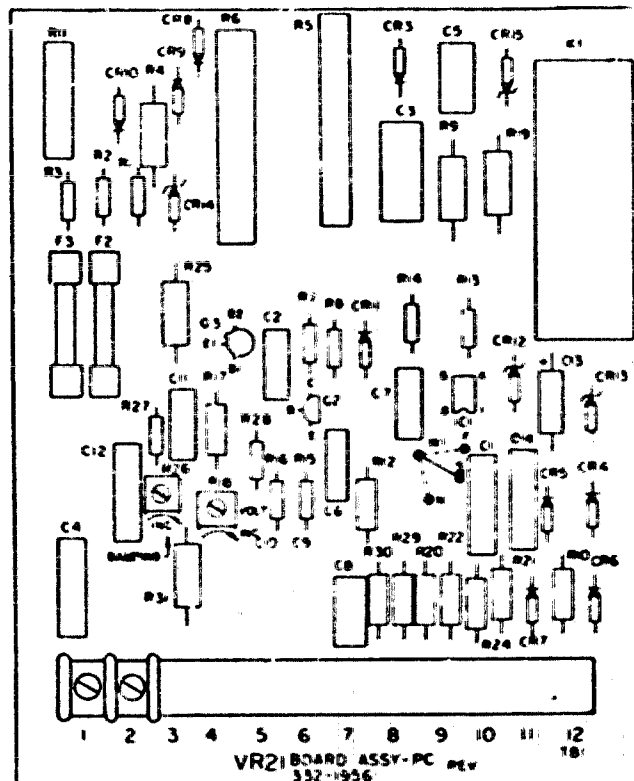
PRINTED CIRCUIT BOARD ASSEMBLY - BRUSH TYPE GENERATOR (SPEC B ONLY)



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
	332-1264	1	Printed Circuit Board - Complete (For Replacement Order 332-1268)	R5	353-0040	1	Resistor, Fixed (270-Ohm, 10 Watt)
TB1	332-1252	1	Terminal Block	R6	353-0039	1	Resistor, Fixed (5,000-Ohm, 15 Watt)
C1	355-0018	1	Capacitor (.47 Mfd., 100 Volt)	R7	350-0398	1	Resistor (3,000-Ohm, 1/2 Watt)
C2, C7	355-0005	2	Capacitor (.22 Mfd., 200 Volt)	R8, R16	350-0447	2	Resistor (330,000-Ohm, 1/2 Watt)
C3, C9	355-0017	2	Capacitor (.47 Mfd., 400 Volt)	R9, R10	350-0423	2	Resistor (33,000-Ohm, 1/2 Watt)
C4	355-0006	1	Capacitor (.47 Mfd., 200 Volt)	R11	352-0151	1	Resistor, Fixed (15,000-Ohm, 5 Watt)
C5, C8	355-0016	2	Capacitor (1 Mfd., 100 Volt)	R12	350-1014	1	Resistor (13,000-Ohm, 2 Watt)
C6	355-0015	1	Capacitor (.1 Mfd., 200 Volt)	R13	350-1007	1	Resistor (6,800-Ohm, 2 Watt)
C10	355-0014	1	Capacitor (.047 Mfd., 200 Volt)	R14	350-0443	1	Resistor (220,000-Ohm, 2 Watt)
C13	356-0039	1	Capacitor (100 Mfd., 10 Volt)	R15	350-0435	2	Resistor (100,000-Ohm, 1/2 Watt)
CR4 thru 11	357-0014	8	Rectifier, Silicon	R17	351-0521	1	Resistor, Metal Film (13,000-Ohm, 1/4 Watt)
CR12	359-0016	1	Diode, Zener (6.8 Volt)	R18	303-0168	1	Potentiometer
CR13	359-0025	1	Diode, Zener (20 Volt)	R20, R22	351-0520	2	Resistor, Metal Film (28,000-Ohm, 1/4 Watt)
CR14	359-0026	1	Diode, Zener (18 Volt)	R21	351-0522	1	Resistor, Metal Film (5,110-Ohm, 1/4 Watt)
CR15	359-0015	1	Diode, Zener (24 Volt)	R24	351-0523	1	Resistor, Metal Film (8,870-Ohm, 1/4 Watt)
K1	307-1063	1	Relay, Magnetic Reed				
Q1, Q2	362-0017	2	Transistor, Silicon (NPN)				
Q3	361-0004	1	Transistor, Unijunction				
R1, R23	350-0355	2	Resistor (47-Ohm, 1/2 Watt)				
R2, R3	350-0351	2	Resistor (33-Ohm, 1/2 Watt)				
R4	350-1075	1	Resistor (4.7 Megohm, 2 Watt)				

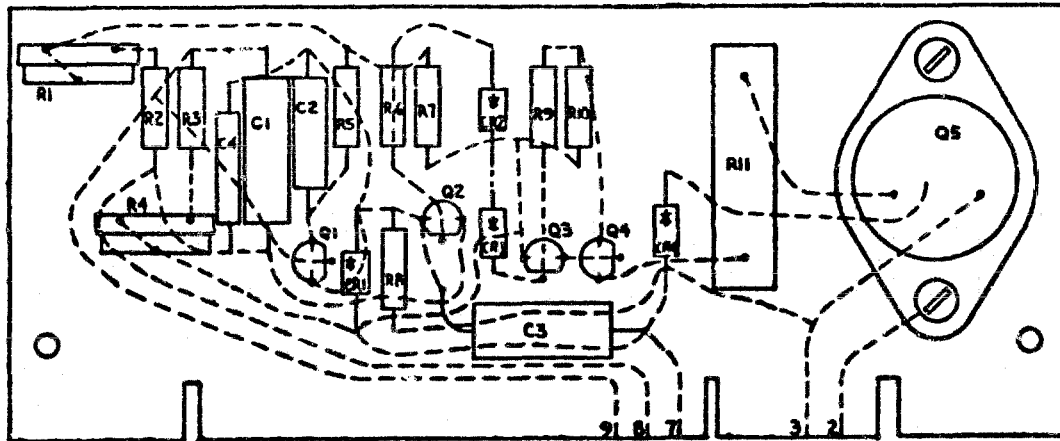
976-0221 (FEBRUARY 1960)

PRINTED CIRCUIT BOARD ASSEMBLY - BEGIN SPEC H



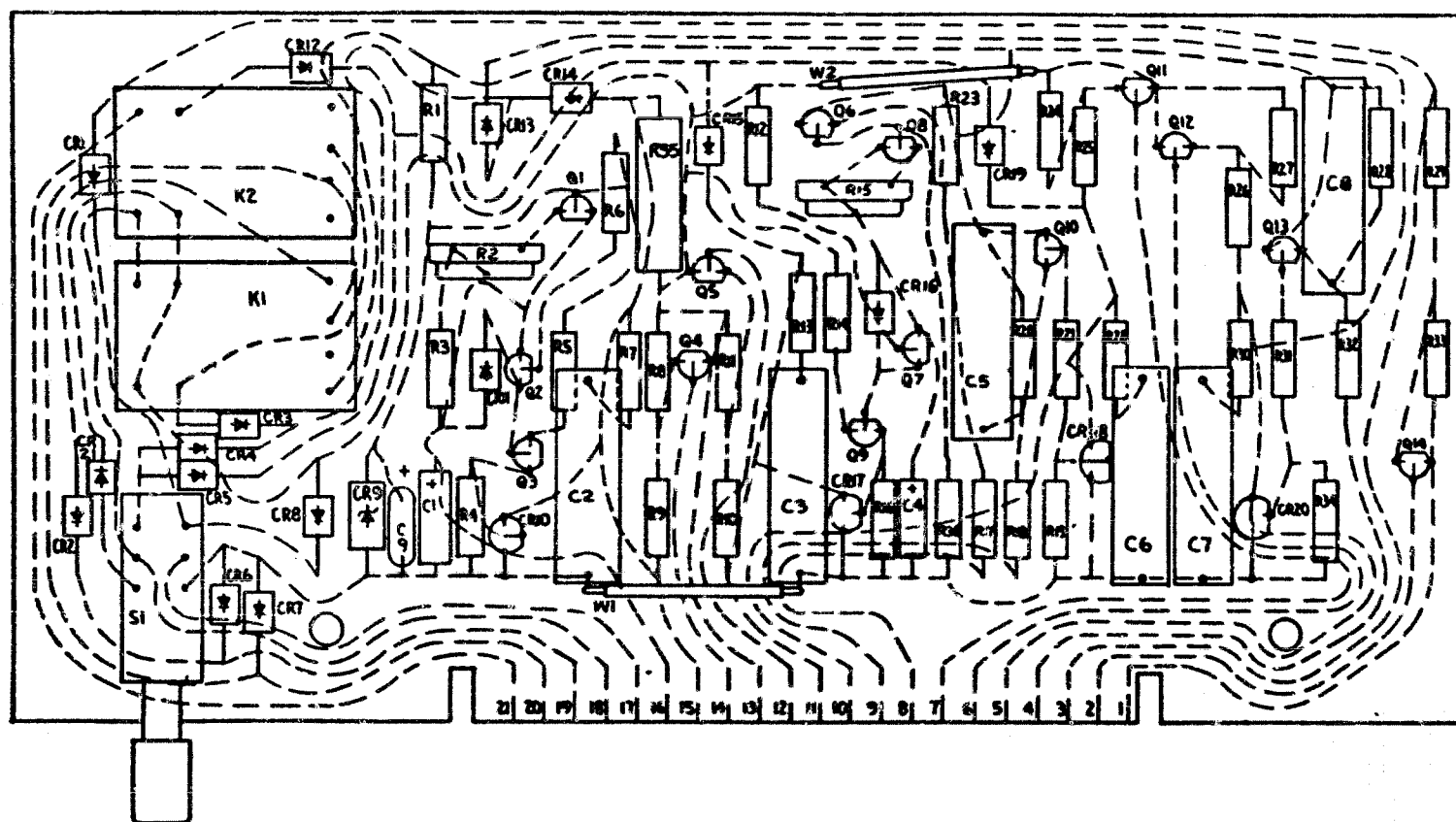
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
	332-1956	1	Board Assembly, Printed - Complete	R7	350-0398	1	Resistor - 1/2 Watt, 3,000-Ohm
C1,14	355-0042	2	Capacitor - 47 Mfd. 250 Volt	R8, R16	350-0447	2	Resistor - 1/2 Watt, 330,000-Ohm
C2, C7	355-0043	2	Capacitor - 22 Mfd. 250 Volt	R10	351-0885	1	Resistor - 1/2 Watt, 51,100-Ohm
C3	355-0047	1	Capacitor - 47 Mfd. 400 Volt	R9,R11	352-0151	2	Resistor - Fixed 5 Watt 15,000-Ohm
C4, C12	355-0044	2	Capacitor - 47 Mfd. 250 Volt	R12	351-0909	1	Resistor - 1/2 Watt, 90,900-Ohm
C5, C8	355-0046	2	Capacitor - 1 Mfd. 100 Volt	R13	350-0411	1	Resistor - 1/2 Watt, 10,000-Ohm
C6	355-0056	1	Capacitor - 33 Mfd. 250 Volt	R14	350-0443	1	Resistor - 1/2 Watt, 220,000-Ohm
C11	355-0048	1	Capacitor - 1 Mfd. 400 Volt	R15, R27	350-0435	2	Resistor - 1/2 Watt, 100,000-Ohm
C13	356-0039	1	Capacitor - Electrolytic 100 Mfd. 10 Volt	R17	351-0293	1	Resistor, Metal Film - 1/4 Watt, 11,000-Ohm
CR3 Thru 11	357-0014	9	Rectifier - Silicon	R18	303-0210	1	Potentiometer - 5,000-Ohm, 1/2 Watt
CR12	359-0036	1	Diode - Zener 5.6 Volt	R20, 22, 29 & 30	351-0520	4	Resistor - 1/4 Watt, 28,000-Ohm
CR13	359-0025	1	Diode - Zener 20 Volt	R21	351-0522	1	Resistor - Metal Film - 1/4 Watt, 5,110-Ohm
CR14	359-0026	1	Diode - Zener 18 Volt	R24	351-0523	1	Resistor - Metal Film - 1/4 Watt, 8,870-Ohm
F2,F3	321-0204	2	Fuse, 1/4 Amp	R25, R31	350-1011	2	Resistor - 2 Watt, 10,000-Ohm
1C1	367-0005	1	Integrated Circuit	R26	303-0211	1	Potentiometer - 1/2 Watt, 100,000-Ohm
Q2	362-0017	1	Transistor - Silicon NPN	R28	350-0568	1	Resistor - 1/2 Watt, 47 Meg-Ohm
Q3	361-0004	1	Transistor - Unijunction	TB1	332-1252	1	Terminal Block
R1	350-0355	1	Resistor - 1/2 Watt, 47-Ohm	CR15	359-0015	1	Diode - Zener - 24 Volt
R2, R3	350-0351	2	Resistor - 1/2 Watt, 33-Ohm		321-0163	6	Clip - Fuse
R4	350-1075	1	Resistor - 2 Watt, 4.7 Meg-Ohm		307-1063	1	Relay, Magnetic Reed
R5	353-0040	1	Resistor - Fixed 10 Watt, 270-Ohm	R19	350-1007	1	Resistor - 2 Watt, 6,800-Ohm
R6	353-0039	1	Resistor - Fixed 15 Watt, 5,000-Ohm				

CRANKER CYCLE CONTROL (OPTIONAL)



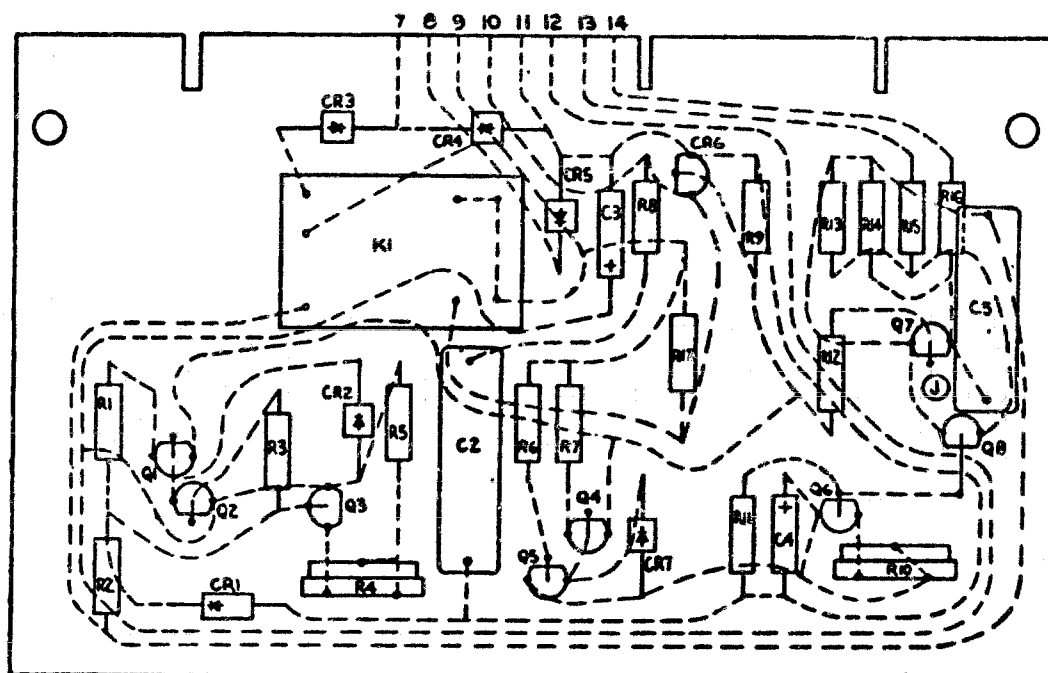
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
	300-0714		Control, Cranker Cycle - 12 Volt	R3	350-0548	1	Resistor, Composition (10,000-Ohm, 1/2 Watt, 10%)
C1	356-0039	1	Capacitor, Electrolytic (100 Mfd., 10 Volt)	R4	303-0171	1	Potentiometer (100,000-Ohm, 1/4 Watt)
C2	355-0029	1	Capacitor, Plastic Dielectric (.015 Mfd., 100 VDC, 10%)	R5	350-0558	1	Resistor, Composition (68,000-Ohm, 1/2 Watt, 10%)
CR1	359-0027	1	Diode, Zener	R6	350-0420	1	Resistor, Composition (24,000-Ohm, 1/2 Watt, 5%)
CR2	357-0004	1	Diode, Rectifier (400 MA, 400 Volt)	R7	350-0546	1	Resistor, Composition (6800-Ohm, 1/2 Watt, 10%)
CR3	357-0004	1	Diode, Rectifier (400 MA, 400 Volt)	R8	350-0520	1	Resistor, Composition (47-Ohm, 1/2 Watt, 5%)
CR4	357-0004	1	Diode, Rectifier (400 MA, 400 Volt)	R9	350-0548	1	Resistor, Composition (10,000-Ohm, 1/2 Watt, 10%)
H1	812-0061	2	Screw, Machine, Round Head (#6-32 x 3/8")	R10	350-0500	1	Resistor, Composition (1-Ohm, 1/2 Watt, 10%)
H2	853-0003	2	Washer, Lock - External Tooth (#6)	R11	352-0152	1	Resistor, Wirewound (25-Ohm, 5 Watt, 5%)
H3	860-0006	2	Nut, Hex (#6-32)	TB1	332-1275	1	Printed Wiring Board
Q1	362-0008	1	Transistor	C3	356-0045	1	Capacitor, Electrolytic (25 Mfd., 15 Volt)
Q2	362-0008	1	Transistor	C4	355-0010	1	Capacitor, Composition (.0022 Mfd., 100 Volt)
Q3	362-0017	1	Transistor				
Q4	362-0026	1	Transistor				
Q5	362-0033	1	Transistor				
R1	303-0171	1	Potentiometer (100,000-Ohm, 1/4 Watt)				
R2	350-0560	1	Resistor, Composition (0.1 Megohm, 1/2 Watt, 10%)				

ENGINE CONTROL MONITOR (5 FAULT LIGHTS) (300-0681)



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
	300-0681		Monitor, Engine Control - 12 Volt - Optional	R2.15	303-0169	2	Potentiometer (3.5 Megohm, 1/4 Watt, 30%)
C1,	356-0040	1	Capacitor, Electrolytic (10 Mfd, 20 Volt)	R3	350-0572	1	Resistor, Composition (1 Megohm, 1/2 Watt, 10%)
C2,3,5, 6,7,8	355-0043	6	Capacitor, Plastic Dielectric (.22 Mfd., 200 VDC, 10%)	R4,16,19,34	350-0517	4	Resistor, Composition (27-Ohm, 1/2 Watt 10%0
C4	356-0030	1	Capacitor, Electrolytic (1 Mfd., 35 Volt)	R5, 14	350-0536	2	Resistor, Composition (1000-Ohm, 1/2 Watt, 10%)
C9	356-0066	1	Capacitor, Electrolytic (47 Mfd., 20 Volt)	R6	350-0548	1	Resistor, Composition (10,000-Ohm, 1/2 Watt, 10%)
CR1-8, 11-16, 19,21	357-0004	16	Diode, Rectifier (1 Amp, 400 Volt)	R7,13,22,30	350-0505	4	Resistor, Composition (2.7-Ohm, 1/2 Watt, 10%)
CR9	359-0027	1	Diode, Zener (1 Watt, 7.5 Volt, 5%)	R8,11,20,21, 23,24,27,28, 31,33	350-0529	10	Resistor, Composition (270-Ohm, 1/2 Watt, 10%)
CR10,17,18, 20	364-0017	4	Diode, Rectifier (8 Amp, 30 Volt)	R9,17,18,25, 29,32,36	350-0540	7	Resistor, Composition (2200-Ohm, 1/2 Watt, 10%)
K1,2	307-1039	2	Relay, Armature (12 Volt)	R10,26	350-0380	2	Resistor, Composition (510-Ohm, 1/2 Watt, 5%)
Q1,2,7,8	362-0031	4	Transistor	R12	350-0552	1	Resistor, Composition (22,000-Ohm, 1/2 Watt 10%)
Q3,9	361-0003	2	Transistor	R35	350-1128	1	Resistor, Composition (220-Ohm, 2 Watt, 10%)
Q4,5,6,10,11, 12,13,14	362-0008	8	Transistor	S1	308-0280	1	Switch, Push - DPDT (1A, 28 VDC/.45A, 115 VAC)
R1	350-0526	1	Resistor, Composition (150-Ohm, 1/2 Watt, 10%)				

ENGINE CONTROL MONITOR (ONE FAULT LIGHT) (300-0679)



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
	300-0679		Monitor, Engine Control 12 Volt
C1	355-0070	1	Capacitor (.022 Mfd., 400 Volt)
C2	355-0069	1	Capacitor (.15 Mfd., 100 Volt)
C3,6	355-0056	2	Capacitor, (.33 Mfd., 250 Volt)
C4	356-0086	1	Capacitor, Electrolytic (47 Mfd., 20 Volt)
C5	356-0051	1	Capacitor, Electrolytic (6.8 Mfd., 35 Volt)
CR1-9	357-0004	9	Rectifier, Diode (400 MA, 400 Volt)
K1	307-1039	1	Relay, (12 Volt)
Q1	362-0048	1	Transistor
Q2	362-0044	1	Transistor
R1	303-0171	1	Potentiometer (100,000-Ohm)
R2,6	350-0121	2	Resistor (27,00-Ohm, 1/4 Watt)
R3,7	350-0137	2	Resistor (120,000-Ohm, 1/4 Watt)
R4	350-0099	1	Resistor (3300-Ohm, 1/4 Watt)
R5	303-0222	1	Potentiometer (50,000-Ohm)
R8,11,13,14	350-0111	4	Resistor (10,000-Ohm, 1/4 Watt)
R9,16,18,19	350-0103	4	Resistor (4700-Ohm, 1/4 Watt)
R10	350-0095	1	Resistor (2200-Ohm, 1/4 Watt)
R12	350-0127	1	Resistor (47,000-Ohm, 1/4 Watt)
R15	350-0363	1	Resistor (100. Megohm, 1/2 Watt)
R17	350-0087	1	Resistor (1000-Ohm, 1/4 Watt)
U1,2	367-0025	2	Timer, Programmable
VR1	359-0002	1	Diode, Zener